

Effluent Disposal from Boats in South Australia

By Dr Len Stephens, Dip Agr Sci, BVSc, MSc, PhD
sv *Equanimity*
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At a Glance...

It's a messy subject but our club is leading the way by making it simple for us. CYCSA has a simple vacuum effluent disposal facility to enable you to empty the holding tank on your boat.



Figure 1: The CYCSA vacuum effluent disposal facility at Marina West

It is located on the seaward jetty of Marina West. This is the most socially acceptable way to dispose of waste water ("black water") from the head on your boat. It is free and we should all use it! You may need to buy a cam fitting for your deck outlet for less than \$10.



Figure 2: The Camlock Pumpout Coupling

If you are away from the marina for an extended period and need to dispose of black water at sea, South Australian Environment Protection Agency regulations state you must do so more than 3 miles from shore or any aquaculture facility. The effluent must pass through a macerator (not just a pump). While not required by law, it is a good idea to add a chemical sanitiser to the holding tank and let it work for an hour or so before discharging the black water.

Disposal of "grey water" (from showers and sinks) is not permitted unless your boat is more than one mile from shore or three miles from an aquaculture lease and, especially, not in the marina.

There is now a network of effluent disposal stations along the Murray River and it is illegal to discharge any black water into the Murray River and other SA inland waters. Discharge of grey water into inland waters will be prohibited after January 1, 2011.

Community expectations demand that these rules are only going to get tougher in future. Standards for new boats require, or soon will require, holding tanks for black and grey waters to be included in all new boats. New marinas must also install effluent disposal facilities.

Introduction

There is something very incongruous about us cruising around the coastal seas for the sheer natural beauty of it and all the while leaving a trail of our own waste water.

Apart from the immediate risks to human health, how will we explain it to future generations when nutrient build up causes algal and jelly fish blooms, robbing them of the very pleasures we enjoy now.

Some people may say that the waste is natural and it eventually breaks down in the great expanse of the oceans – so what

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is the problem? The problem is that the amount of bacterial pollution from one weekend boater's discharge of untreated sewage is equal to the bacterial pollution resulting from treated sewage of 10,000 people over the same weekend¹! We do not have the right to continue doing this

Fortunately, for CYCSA members who have holding tanks on their boat, there is a very simple solution; storing the waste in the holding tank and emptying it at the vacuum effluent disposal facility at Marina West. This single action will eliminate a large proportion of the marine pollution we are responsible for.

Guidelines and Regulations

The SA government *Environment Protection (Water Quality) Policy, 2003*² sets the framework for all decisions and Codes of Practice concerning water quality in SA.

For marine and inland waters the key document is the *Code of Practice for vessel and facility management (marine*

*and inland waters), 2008*³. This document outlines what must be done and what is recommended to be done by marina operators and boat owners to prevent pollution due to sewage, refuelling, boat cleaning, anti fouling, sanding, painting, etc.

To assist boat owners comply with the Code of Practice the South Australian EPA has produced a guideline called *Managing vessel wastewater for black and/or grey water, 2008*⁴.

For those that use the River Murray, the SA department of Water, Land and Biodiversity Conservation has recently produced a booklet called *River Vessel Waste Disposal Options, 2009*⁵.

It is the Code of Practice that sets the rules. The Code contains "required outcomes" that are legally enforceable by the EPA.

Black water is any waste from a toilet. Here are the rules for black water, copied directly from the Code:

Marine waters vessel operators must:

1. Only discharge untreated black water provided:
 - a. The vessel is underway on marine waters,
 - b. The vessel is more than three nautical miles from the nearest land, an aquaculture lease or people in the water, and,
 - c. Black water has been macerated into a fine slurry. Pump valves on hand or electric pumps on a marine head are not considered as macerators.
2. Not use formaldehyde based chemical treatments as a sanitising agent for toilets.

The Code of Practice also contains a number of recommended practices, which in due course may become required

outcomes. Some of the most significant of these are:

Marine waters vessel operators should (recommended practices):

- Use land-based amenity facilities
- Retain black water on board the vessel for disposal into a land-based wastewater collection facility
- Install onboard wastewater treatment system that surpasses the discharge standards outlined in this code to reduce even further the impacts on the marine environment

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Grey water is waste water that has been used for washing, laundering, bathing or showering. The Code of Practice states

that grey water is less of a risk to human health than black water. The rules for grey water are:

Marine waters vessels operators must:

Only discharge untreated grey water provided that:

- The vessel is more than one nautical mile from the nearest land or people in the water
- The vessel is three nautical miles from the nearest aquaculture lease, and
- There are no visible solids.

The rules for the Murray River and Inland Waters are more stringent. You simply cannot discharge any waste water. Black and grey water must be retained in holding tanks on board and discharged at a land based collection site. This requirement for grey water applies to all new and commercial boats and will come into force for all other boats on 1 January 2011.

All the information above applies to *untreated sewage* as defined by the Australian Maritime Safety Authority. The authority has also defined three grades of treated sewage for commercial shipping. Type C treated sewage is the lowest level of treatment and consists only of sanitising the waste water to kill bacteria in it prior to discharge. In a potential sign of things to come, the Great Barrier Reef Authority has made it mandatory for boats within its jurisdiction to only discharge treated sewage. See *On Board Waste Water Treatment Systems* below.

Black Water Disposal

As mentioned in the introduction, for boats with a holding tank this is not a problem if you are close to a waste collection facility, such as the one at Marina West. Look for the green coiled hose attached to a hydrant on the seaward dock. (See figure 1).

Most boats will have a hose connecting the bottom of the holding tank to a deck fitting with a screw cap. You will need to buy a Camlock Pumpout Coupling that screws in to the deck fitting and has a "cam" connection at the other end. (See figure 2).

This cam fitting locks neatly into the hose of the vacuum collection system.



Figure 3: Pumpout hose connected to deck fitting via Camlock Coupling

Then simply turn the tap on the shore facility that activates the vacuum. It is about as simple and mess free as you can get! Boating suppliers have plastic Camlock Couplings for about \$10 and brass fittings for around \$35.

If you are cruising on the Murray River there are thirteen waste water collection facilities at various points. These are detailed in the booklet *River Vessel Waste Disposal Options, 2009*⁽⁵⁾.

Unfortunately, the one weakness of this solution to pollution of South Australia's marine waters is the lack of collection facilities at ports used by recreational vessels. I rang around some ports during November 2009 and found that the only other facility like the one at Marina West is at the new Cape Jaffa Marina. The facility at Wirrina is currently out of service and the Port Lincoln facility is only for

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commercial vessels. There are no facilities for recreational boats at other ports as far as I am aware. If you find one, please let us know! Perhaps the "authorities" could look at this in future as a worthwhile investment of boating licence fees!

Consequently, if you are on an extended cruise, there is no other option than to dispose of the holding tank contents at sea. This is legally permissible if it is done more than three miles from shore or any aquaculture lease. The contents must be macerated and discharge must be done while the boat is underway.

If your boat does not have a holding tank, the only solution is to "hold on" until you are three miles out! Hopefully this article will set you thinking about installing a holding tank. In response to the increasing stringency of waste water disposal regulations commercial operators are offering a range of solutions, including custom designed tanks to fit your boat. Some suppliers are listed at the end of this article.

It is likely that at some stage in the future we will be required to carryout primary treatment to kill the microorganisms in black water before it is discharged from the holding tank. This is usually done with a chemical treatment, as long as the chemical used is not itself toxic and the amount used is sufficient to treat the sewage but not kill everything else in proximity to your boat when you discharge.

There are plenty of commercially available chemical treatments for this purpose, but note that some treatments only clean the system and do not kill the bacteria. A commonly available product is *Portasol* (glutaraldehyde + quarternary ammonium compound). For more options see:

www.lets-getaway.com/sanitation-products-toilet-chemicals.htm

The chemical can be added to the holding tank via the toilet bowl and left for an hour to work prior to discharge. While it is not mentioned in any of the EPA guidelines for

SA, it would seem like a common sense thing to do and it helps with odour control.

Grey Water Disposal

Very few recreational boats on South Australian marine waters have holding tanks for grey water. That means when we are anchored overnight in a beautiful bay somewhere close to shore (not in the marina!) the water from your washing up goes straight out the side. Fortunately the EPA guidelines, while clearly not permitting this, do acknowledge that grey water is a much less significant cause of pollution than black water. If I get a new boat it will have a grey water holding tank, but what happens until then? The easiest thing to do is hold the water in the sink until you are far enough out to sea.

I am presently looking at installing a two way valve tap in the sink drain pipe. When necessary the grey water can be directed to an old 20 litre plastic water container on the floor of the galley. The container can then be emptied at the waste water collection facility or out to sea.

On Board Waste Water Treatment Systems

Commercial boats have on-board systems to hold and treat both grey and black water prior to discharge. This is an area for professional water treatment engineers. However, the cost and effectiveness of these systems is improving and they are now installed in many new recreational boats, particularly in Queensland where the Great Barrier Reef Authority requires primary treatment of sewage prior to discharge.

A Brisbane based company, Nautical Waste Solutions, produces a range of *Aqua-san* marine toilet systems. These systems use electrolysis of sea water to make chlorine which is then used to treat the contents of the tanks prior to discharge. Another Brisbane based company, *Sani Loo* also produces a range of systems.

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Uric Acid Scale in Holding Tanks

It is beyond the scope of this article to review all the things that can go wrong with the head. However, if you use a holding tank, you will eventually get a blockage due to uric acid scale accumulation, caused by urine reacting with seawater. This can be minimised by emptying the holding tank at Marina West and flushing it with fresh water before you leave the boat unattended for long periods.

The scale can be removed by filling the tank and pipes with 10% phosphoric acid solution and letting it stand for six hours before emptying and flushing at sea. Phosphoric acid is not a pollutant. It can be obtained as the commercial product *Sew Clean* from *Stella Systems* in Brisbane or bought from *Chem Supply* in

Port Adelaide in a 10 litre container of 85% solution.

Planning Extended Travel

It is perhaps worth noting, if you intent to undertake overseas travel, to check local regulations as some areas have No Discharge Zone (NDZ) legislation in place. Quite a number of States in USA⁶ for example the state waters within the Florida Keys National Marine Sanctuary (three miles from land on the Atlantic Ocean side of the Florida Keys and nine miles from land on the Gulf of Mexico side of the Florida Keys) where discharge of sewage (black water), whether treated or not treated, is prohibited from all vessels⁷. If you are even found with the *ability* to turn a diverter valve to a direct discharge position (even without it actually being in that position) you can be fined.

Important Note:

- This information is provided for your interest only. It is intended to be a starting point only for your own research. It is not to be relied upon for any decisions.
- For feedback, questions or updates please contact:
Chair, Cruising Association Committee, Cruising Yacht Club SA,
Address: Lady Gowrie Drive, North Haven South Australia 5018
Postal: PO Box 1020 North Haven, South Australia 5018
Email: reception@cyca.com.au

References

¹ Using Your Head to Help Protect Our Aquatic Resources. United States Environment Protection Agency. www.epa.gov/owow/oceans/regulatory/vessel_sewage/vsdpdflyer.pdf

² Environment Protection (Water Quality) Policy. Environment Protection Agency South Australia 2003 [www.legislation.sa.gov.au/LZ/C/POL/ENVIRONMENT%20PROTECTION%20\(WATER%20QUALITY\)%20POLICY%202003.aspx](http://www.legislation.sa.gov.au/LZ/C/POL/ENVIRONMENT%20PROTECTION%20(WATER%20QUALITY)%20POLICY%202003.aspx)

³ Code of Practice for vessel and Facility management (marine and inland waters). Environment Protection Agency South Australia (September 2008) www.epa.sa.gov.au/xstd_files/Water/Code%20of%20practice/vessels.pdf

⁴ Managing vessel wastewater for black and/or grey water. EPA Guideline 709/07 (October 2008) www.epa.sa.gov.au/documents.php?cat=9&subcat=26&q=&x=13&y=10

⁵ River Vessel Waste Disposal Options, Edition No 2 (2009) www.dwlbc.sa.gov.au/assets/files/RVWDS_Booklet2009.pdf

⁶ http://www.epa.gov/owow/oceans/regulatory/vessel_sewage/vsdnozone.html

⁷ <http://www.co.monroe.fl.us/ndz/info.htm>